

REMARKS

Claims 1-20 are pending in this application. Claims 13-20 have been withdrawn as directed to subject matter that was not elected in response to the Restriction Requirement mailed July 21, 2006. Although the Office Action indicates claim 10 as being withdrawn, Applicants' election of Group I, Subgroup IA included all claims 1-12, as indicated in the Restriction Requirement. Applicants respectfully submit that claim 10 therefore constitutes elected subject matter that should be presently examined (*i.e.*, not withdrawn from consideration).

Independent claim 1 has been amended to delete the phrase "at least one of said veneers has a moisture content of less than about 7% by weight."

No new matter is added.

The Rejection of Claims 1-12 under 35 U.S.C. § 103

The Office Action rejects claims 1-4, 6-9, and 11 as being obvious over the combination of Whittemore (U.S. Patent No. 5,106,697; "Whittemore") and Baxter (U.S. Patent No. 4,915,766; "Baxter"). The Office Action further combines Whittemore and Baxter with Detlefsen *et al.* (U.S. Patent No. 5,057,591; "Detlefsen"), Walser *et al.* (U.S. Patent No. 5,234,747; "Walser"), and Park *et al.* (U.S. Patent No. 6,569,279; "Park") to reject claims 5 and 12. Applicants respectfully traverse these rejections insofar as they apply to claims 1-12 as amended.

Independent claim 1 and its dependent claims 2-12 are directed to a method for making laminated veneer lumber (LVL) from a plurality of wood veneers by applying an adhesive onto a wood veneer mating surface. The adhesive comprises both a thermosetting phenol-aldehyde resin and a ketone-aldehyde resin cure promoter. The thermosetting phenol-aldehyde resin has a

recited degree of advancement or polymerization, and in particular a number average molecular weight (M_n) of at least about 450, a weight average molecular weight (M_w) of at least about 2000, and/or a Z-average molecular weight (M_z) of at least about 6000. Additionally, the wood veneers have a recited level of dryness, and in particular an average moisture content of less than about 10% by weight for the plurality of veneers.

The Office Action cites Whittemore, Baxter, Detlefsen, Walser, and Park as teaching the features of the pending claims. Contrary to the Office Action's contentions, however, these references, whether taken alone or in any combination, fail to render claims 1-12 *prima facie* obviousness under 35 U.S.C. § 103. The pending claims are patentable at least because there would have been no motivation to combine these references, in the manner set forth in the Office Action, to arrive at the claimed invention.

The disclosures of both Whittemore and Baxter are directed to adhesives for making plywood from veneers having a high moisture content:

Resins of the present invention are particularly suitable for preparing adhesives used for making plywood, particularly plywood made from veneers having a relatively high average moisture content.

The resin has a particular utility for making plywood adhesives used to bond veneers of relatively high average moisture content.

See Whittemore at col. 3, lines 26-29 and lines 44-47.

In addition to making it possible to prepare wood laminates from high moisture content veneer, the improved adhesive mixture of the present invention alternatively permits a significant increase in the rate of plywood panel production.

See Baxter at col. 3, lines 5-9.

Consistent with this description, the working examples of Whittemore and Baxter describe the preparation of plywood having 3-5 veneer layers. See Whittemore at col. 8, lines 40-41 and Baxter at col. 11, lines 5-6.

One of ordinary skill would therefore clearly understand Whittemore and Baxter as addressing problems, particularly steam “blow out,” associated with using high moisture veneers in plywood manufacture. In fact, these problems are discussed in detail in both references. See, for example, Whittemore at col. 1, lines 46-59 and Baxter at col. 1, lines 40-56. However, nothing in these references would suggest that the combination of a relatively advanced phenol-aldehyde resin and ketone-aldehyde resin cure promoter would be advantageous in an adhesive for preparing LVL from a plurality of veneers having a **low moisture content**. In fact, Applicants alone have discovered the surprising benefits associated with these characteristics of the claimed process.

In particular, Applicants have determined that the claimed, advanced phenol-aldehyde resins, when used in combination with a ketone-aldehyde resin cure promoter, provides superior resistance to glue line dryout, an art-recognized difficulty encountered in LVL manufacture from low-moisture veneers. See paragraph [0028] of the specification. Also see paragraph [0033]:

although the thermosetting phenol-aldehyde resin has molecular weight characteristics of an advanced polymer, it is nevertheless suitable for use with low-moisture veneers, without the adhesive bond integrity being compromised by glue line dryout. This property of the adhesives of the present invention is contrary to conventional industry belief regarding the relationship between the phenol-aldehyde resin molecular weight and propensity for dryout. Because the overall composition of adhesives of the present invention are in fact resistant to dryout, they are suitable for making LVL from a plurality of wood veneers. . .

Moreover, Applicants have experimentally verified this improvement, over conventional adhesives, in LVL bond integrity resulting from the use of an advanced phenol-aldehyde resin in

combination with a ketone-aldehyde cure promoter. See Examples 4 and 5, demonstrating that the press time associated with this adhesive can be reduced relative to conventional adhesives, without sacrificing bond strength, in the case of wood veneers having 6-8% moisture. Examples 4 and 5 evaluated LVL manufactured from 15 veneers (1.75 inches total thickness) and 28 veneers (3.5 inches total thickness), respectively. Again, these surprising characteristics of such adhesives in LVL production from low moisture veneers are found only in Applicants' specification and are nowhere suggested in the prior art.

It is well established that a *prima facie* case of obviousness requires some suggestion or motivation to combine the reference teachings with a reasonable expectation of success. Manual of Patent Examining Procedure, 8th ed., § 2143. Obviousness is based on factual inquiries, including the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The person having ordinary skill is described in *Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*:

The person of ordinary skill is a hypothetical person who is presumed to be aware of all the pertinent prior art. The actual inventor's skill is not determinative. Factors that may be considered in determining level of skill include: type of problems encountered in art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.

807 F.2d 955, 962-63 (Fed. Cir. 1986).

Being aware of all pertinent prior art, the person of ordinary skill would have been well aware of the problems, including weak bonds and even delamination, associated with glue line dryout in LVL manufacture from dry veneers. Relative to plywood manufacture, glue line dryout in the case of LVL production is a greater concern, due at least in part to the significantly higher number of veneers used (*e.g.*, typically 13-30 veneers for LVL versus 3-5 veneers for plywood).

Even in the case of plywood, which is less prone to glue line dryout than LVL, the person of ordinary skill would have understood that, "It is estimated that over 95% of the deficient bonds in southern pine plywood produced in 1980 involved a form of dryout. Dry veneer below 3% moisture content can result in severely dried-out gluelines." See Sellers, Jr., *PLYWOOD AND ADHESIVE TECHNOLOGY*, Marcel Dekker, Inc., at p. 423. Furthermore, when phenol-formaldehyde resin adhesives are used, this dryout problem is believed to be exacerbated by the use of resins having a high molecular weight. See Gollob, L., "The Interaction of Formulation Parameters with Chemical Structure and Adhesive Performance of Phenol-Formaldehyde Resins," Doctoral Thesis submitted to Oregon State University, 1982.

Moreover, as explained above, one of ordinary skill would recognize the teachings of Whittemore and Baxter as directed to problems associated with the use of high moisture veneers in plywood manufacture. There is nothing in these references to fairly teach or suggest that the adhesives recited in the pending claims, comprising an advanced phenol-aldehyde resin in combination with a ketone-aldehyde cure promoter, would lead to the surprising benefits, as discussed above, in the claimed process of making LVL from low moisture veneers. Consequently, there is no motivation to combine Whittemore and Baxter, in the manner proposed in the Office Action, to arrive at Applicants' claimed invention. Absent such motivation, the Office Action "can do no more than piece the invention together using the patented invention as a template. Such hindsight reasoning is impermissible." *Texas Instruments Inc. v. U.S. ITC*, 988 F.2d 1165, 1178 (Fed. Cir. 1993).

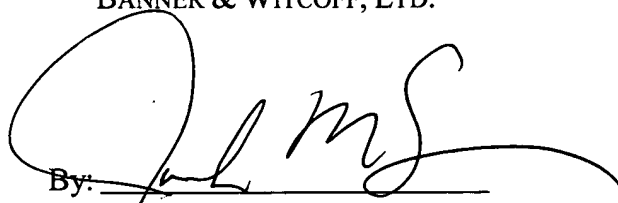
For the above reasons, Applicants respectfully submit that the teachings of Whittemore and Baxter do not render the pending claims *prima facie* obvious. The additional applied references Detlefsen, Walser, and Park similarly fail to overcome the deficiencies noted above with respect to Whittemore and Baxter. The invention of claims 1-12 is therefore patentable over Whittemore, Baxter Detlefsen, Walser, and Park taken alone or in any combination.

Reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

In view of the above remarks, all pending claims of this application are believed to be in condition for allowance. A written indication of the same is respectfully requested. This response is believed to completely address all of the substantive issues raised in the Office Action mailed September 25, 2006.

Respectfully submitted,
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